UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/057,026	01/24/2002	Chung-Chu Chen	64,600-090	2073

7590 07/08/2003

TUNG & ASSOCIATES
Suite 120
838 W. Long Lake Road
Bloomfield Hills, MI 48302

EXAMINER	
BROOKE, MICHAEL S	
ART UNIT	PAPER NUMBER
2853	

DATE MAILED: 07/08/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
www.uspto.gov

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Paper No. 10

Application Number: 10/057,026
Filing Date: January 24, 2002
Appellant(s): CHEN ET AL.

Randy W. Tung
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 06/04/03.

(1) Real Party in Interest

A statement identifying the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The brief does not contain a statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief. Therefore, it is presumed that there are none. The Board, however, may exercise its discretion to require an explicit statement as to the existence of any related appeals and interferences.

(3) Status of Claims

The statement of the status of the claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Invention

The summary of invention contained in the brief is deficient because a first and second insulating layer are not formed on the top and bottom surfaces. In the final structure, illustrated by figure 3F, only the first insulating layer (16) is present. The Appellant has amended the claims to reflect this fact.

(6) Issues

The appellant's statement of the issues in the brief is correct.

(7) Grouping of Claims

The rejection of claims 11-20 stand or fall together because appellant's brief does not include a statement that this grouping of claims does not stand or fall together and reasons in support thereof. See 37 CFR 1.192(c)(7).

(8) Claims Appealed

The copy of the appealed claims contained in the Appendix to the brief is correct.

(9) Prior Art of Record

EP 317171	Leban	05/1989
5,831,648	Mitani et al.	11/1998
5,308,442	Taub et al.	05/1994
6,214,245	Hawkins et al.	04/2001
US 2002/0012027	Moon et al.	01/2002

(10) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 11, 12, 14-17 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Leban (EP 317 171) in view of Mitani et al. (5,831, 648), Taub et al. (5,308,442) and Hawkins et al. (6,214,245).

Leban teaches a monolithic ink jet print head comprising a silicon substrate (32), two spaced apart heaters (42 and 44) made of TaAl (p. 3:43) are formed on the top surface of the substrate. Heater (42) is provided to ejected ink and heater (44) is provided to improve refill speed. At least two interconnects are provided, wherein each interconnect is in communication with one of the resistors. An insulation layer (46) is formed on top of the spaced apart heaters. This layer is the same as the claimed third insulating layer. A barrier layer (48), having a thickness of between 100,000 to 750,000 Å (see Table), is made of VACREL or RISTON, both of which are photoimagable materials The layer (48) is the same as the claimed first photoresistive layer. As can be seen in Fig. 1B, the ink chamber has primary and auxiliary (52 and 54) portions, wherein the heater (44) is positioned in the auxiliary portion and the heater (42) is positioned in the primary ink chamber. A nickel orifice plate (56) is provided on the barrier layer (48). Leban is silent as to the shape of the ink feed slot, however, Fig. 5 does show that the ink is feed from below and through the substrate.

Leban teaches the claimed invention with the exception of a first insulating layer made of silicon dioxide and having a thickness of at least 1000 Å, a funnel shaped manifold in the substrate, a metal seed layer on the first photoresistive layer, a nickel layer on top of the metal seed layer, the heater in the primary ink chamber being ring-shaped and the seed layer being either Ni or Cr.

Mitani et al. teaches (Fig. 31) an ink jet print head comprising a silicon substrate (301) and a silicon dioxide insulation layer (317) formed between the substrate and a heater (303). The insulation layer is about 1 to 2 microns thick (10,000 to 20,000 Å) and insulates the substrate from heat generated by the heater (col. 24:21-25).

It would have been obvious to one of ordinary skill in the ink jet art at the time the invention was made, to have provided Leban with a silicon dioxide insulating layer having a thickness of at least 1000 Å for the purpose of insulating the substrate from the heat generated by the heater, as taught by Mitani et al.

Taub et al. teaches an ink jet print head having funnel shaped ink fill slots formed therein. The use of an ink slot having this provides increased flow capacity to adequately respond to ink volume demands (col. 1:56-59).

It would have been obvious to one of ordinary skill in the ink jet art at the time the invention was made, to have provided Leban with a funnel shaped manifold for the purpose of adequately responding to ink volume demands, as taught by Taub et al.

Hawkins et al. teaches a method of forming an orifice plate for an ink jet print head wherein a Ni or Cr seed layer (444) is formed over a substrate and then a plate layer of nickel (446) is deposited over the seed layer, so that the seed layer and the plate layer form a nozzle plate (445) (col. 8:52-65). The use of the seed layer allows for the production of very small or critically dimensioned nozzle plates which are thin and flexible (col. 8:27-30).

It would have been obvious to one of ordinary skill in the ink jet art at the time the invention was made, to have provided Leban with a metal seed layer on the first

photoresistive layer, a nickel layer on top of the metal seed layer, for the purpose of making a nozzle plate that is very small or critically dimensioned and which is thin and flexible, as taught by Hawkins et al.

9. Claims 13 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Leban (EP 317 171) in view of Mitani et al. (5,831, 648), Taub et al. (5,308,442) and Hawkins et al. (6,214,245), as applied to claims 11, 12, 14-17 and 20 above, and further in view of Moon et al. (US 2002/0012027).

Leban, as modified, teaches the claimed invention with the exception of a ring-shaped heater positioned in the primary ink chamber.

Moon et al. teaches (Fig. 5) an inkjet print head having a ring shaped heater (50') that is centered under nozzle (102a). The use of a ring-shaped heater simplifies manufacturing, prevents satellite droplets and prevents cross-talk with adjacent nozzles (p. 2:0037).

It would have been obvious to one of ordinary skill in the ink jet art at the time the invention was made, to have provided Leban with a ring-shaped heater in the primary chamber, for the purposes of simplifying manufacturing, preventing satellite droplets and preventing cross-talk with adjacent nozzles, as taught by Moon et al.

(11) Response to Argument

Before addressing the Appellant's arguments, the examiner wishes to point out that amendment filed on 03/17/03 has overcome the rejection under 112 2nd paragraph.

The Appellant argues that the combination of Leban and Taub et al. fail to teach "a funnel-shaped manifold that is in fluid communication with both a primary and an auxiliary ink chamber." This argument is not persuasive.

The Appellant bases their argument on an admission, allegedly made by the Examiner, that Leban "does not teach an ink manifold at all." The Appellant then reasons that since Leban does not teach an ink manifold, that there would be no reason to modify Leban with the funnel shaped manifold of Taub et al. It appears that the Appellant does not understand the Examiner's position with regard to the ink manifold of Leban. For convenience, the Examiner has reproduced figure 5 of Taub et al.

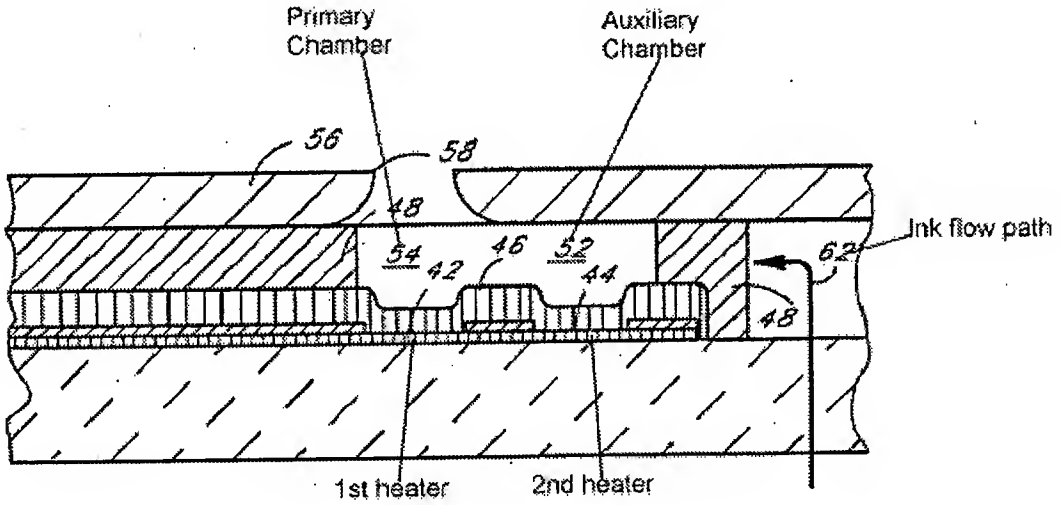

FIG 5

As can be seen in the figure, an ink flow path (62) is provided through the substrate, in order to supply ink to both the primary and auxiliary ink chambers (52 and 54). The ink flow path would be in the form of an opening that is provided through the substrate. This ink flow path is the equivalent of an ink manifold, since like the claimed

manifold, it supplies ink to the ink chambers. This feature was pointed out to the Appellant in both the first office action and the final office action. Thus, the Examiner did not state that Leban did not "teach an ink manifold at all." Rather, the Examiner stated that Leban did not teach an ink manifold having a funnel shape.

A funnel shaped manifold is taught by Taub et al., which uses such a manifold to improve ink refilling speed in order to cope with the higher ink demands of high speed printing (col. 1:56-59 and col. 2:25-28).

Since Leban does teach an ink manifold and Taub et al. teaches the reasons for providing a funnel shaped manifold, the rejection under 35 U.S.C 103(a) is proper.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Michael S. Brooke
Examiner
Art Unit 2853

MSB
July 2, 2003

Conferees
Stephen Meier SDM
Olik Chaudhari

Stephen D. Meier
Primary Examiner

TUNG & ASSOCIATES
Suite 120
838 W. Long Lake Road
Bloomfield Hills, MI 48302